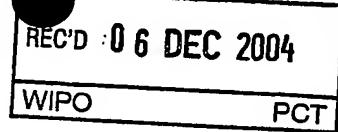


PATENT COOPERATION TREATY

PCT



INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 9419WO/BD		FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/SE2003/001270	International filing date (day/month/year) 13-08-2003	Priority date (day/month/year) 14-08-2002	
International Patent Classification (IPC) or national classification and IPC H02K 41/03, H02K 35/02, F02B 71/04			
Applicant Volvo Technology AB et al			

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
 - a. ☐ (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

Date of submission of the demand 11-03-2004	Date of completion of this report 11-11-2004
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer Irma Bornhede/MN Telephone No. +46 8 782 25 00

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE2003/001270

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☒ This report is based on a translation from the original language into the following language English, which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1(b))
☒ publication of the international application (under Rule 12.4)
☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☒ the international application as originally filed/furnished

☐ the description:

pages _____ as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☐ the claims:

pages _____ as originally filed/furnished

pages* _____ as amended (together with any statement) under Article 19

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☐ the drawings:

pages _____ as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing (*specify*): _____
☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing (*specify*): _____
☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE2003/001270

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-29</u>	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	<u>1-29</u>	NO
Industrial applicability (IA)	Claims	<u>1-29</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

The invention concerns an electrical machine of the transversal-flux type and the use of it. The object of the invention is to provide an electrical machine of the transversal-flux type with a high torque density and with improved power factor.

Reference is made to the following documents:

D1: WO 0 178 218 A1

D2: US 6 229 238 B1

D3: WO 0 178 219 A1

D4: US 5 117 142 A

D5: US 5 051 641 A.

The document D1 is considered to represent the closest prior art. D1 describes an electrical machine including a stator which includes a plurality of magnetic flux conductors. The machine also includes an electric conductor forming a winding extending in a substantially closed winding path through each magnetic flux conductor. The machine also includes a movable element which includes a number of permanent magnet elements and which is movable in a reciprocating movement in relation to the stator along a movement path. The winding path includes a first current carrying portion, which extends substantially in parallel with the movement path. Each magnetic flux conductor is arranged to form, together with one of the permanent magnet elements, a closed magnetic flux circuit extending around the current carrying portion. Each permanent magnet element includes a magnet having a north and a south pole. The magnetic flux in each magnetic flux circuit is parallel to a plane, which is perpendicular to the respective

.../...

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of: BOX V

movement path. The magnetic flux conductors are provided in an alternating order with regard to the direction of the magnetic flux in relation to the permanent magnet elements in the respective magnetic flux circuit.

Claim 1

The invention according to claim 1 differs from the device in D1 in that the adjacent permanent magnet members are separated from each other by an intermediate member comprising at least one secondary magnet which has a north pole and a south pole and a magnetic direction extending from the south pole to the north pole and across the magnetic direction of the primary magnet.

Due to these features, a small magnetic leakage is obtained. Consequently, with the background of D1, the problem is to produce a device which obtains a small magnetic leakage.

A solution to this problem is known from document D2 which describes a transversal flux machine having a stator and a rotor. The rotor comprises two rows of respectively alternately arranged permanent magnets and soft-iron reflux elements. The permanent magnet elements protrude axially as well as radially beyond the soft-iron reflux elements in order to prevent an excessive leakage flux in the case of permanent magnets.

Thus, the person skilled in the art, having the device known from D1 as a starting point, aiming to solve the identified problem, would with the knowledge of D2 arrange the magnetic elements both radially and axially and thus arrive at the invention according to claim 1. Since D1 and D2 both relate to the same technical field and no unexpected effect is obtained, the combination of what is known from D1 and D2 is considered obvious for a person skilled in the art.

Therefore, the subject-matter defined in claim 1 does not involve an inventive step.

Claims 2-29

.../...

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE2003/001270

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: BOX V

In view of the cited art and general knowledge, the features defined in claims 2-29 are considered to be measures obvious to a person skilled in the art.

Accordingly, the invention defined in claims 2-29 lacks inventive step.